Chemical & Engineering NEWS

Learning chemistry from chemistry sets Page 40

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Chemical capital spending

Restrained in 1980 Page 14

December 10, 1979
Volume 57, Number 50
CENEAR 57 (50) 1-70
ISSN 0009-2347

Chemical & Engineering NEWS

Cover: Union Carbide's newly expanded liquid hydrogen plant at Ashtabula, Ohio

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News of the Week

- ***Industry will be able to meet clean-air goals*** *in a cost-effective, more flexible manner under EPA's bubble concept, the regulatory agency claims.* **Page 6**
- ***Mary L. Good*** *elected chairman of the ACS Board of Directors for 1980; committee chairmen appointed.* **Page 6**
- ***Plastics' good showing in 1979*** *is beginning a fourth-quarter slide, but sales are expected to be 9.4% higher than in 1978 and export market will remain strong.* **Page 7**
- ***An economic downturn*** *in first-half 1980 will be reversed by year's end, forecast Conference Board and National Association of Purchasing Management.* **Page 7**
- ***Du Pont will sell 80% of its dyes business*** *to four different companies—Mobay Chemical, Morton Chemical, Ciba-Geigy, and Crompton & Knowles.* **Page 8**
- ***The biennial Chem Show,*** *held this year in New York City's Coliseum, will become an annual event, alternating between New York and Chicago.* **Page 8**

Business

- ***U.S. chemical firms' worldwide capital spending*** *will rise 13% in 1980, after 19% gain in 1979, but inflation will erode most of budgeted increase.* **Page 14**
- ***Hydrogen peroxide capacity*** *will be boosted substantially by new Interox America plant on stream, FMC plant scheduled to start up next year.* **Page 16**

Government

- ***Complications of setting air quality standards*** *pointed up at subcommittee hearings involving EPA, lead smelter, and citizens of Idaho community who claim children are harmed by high lead levels.* **Page 22**
- ***Bills to change patent law and policy,*** *including patent protection for work done under government sponsorship and reduction of litigation on patent challenges, triggered by concern over innovation.* **Page 26**

Science

- ***Electrides****—compounds of alkaline metal elements and electrons—behave in unusual manners; inability to crystallize them to determine their structure frustrates researchers in metallic chemistry.* **Page 32**

Education

- ***Producers of chemistry sets****—frequently the child's introduction to the fascination of the world of chemical science—face a declining market as population of nine- to 12-year-olds diminishes.* **Page 40**

Chemical capital spending up a notch in 1980

After 19% upswing in 1979, worldwide capital spending by U.S. chemical firms will rise 13% in 1980; inflation will eat up most of gain

William F. Fallwell
and William J. Storck
C&EN, New York

Despite a handsome increase in the U.S. basic chemical industry's available funds for new investment in 1979, actual outlays for capital projects (new plant and equipment) this year and next will be relatively modest.

Gains in capital spending, the largest use of company revenue after running costs and taxes, will lag behind the increase in cash flow (net income plus depreciation). Spending will barely keep up percentagewise with the gain in company sales this year and will do little better in 1980.

This restraint is in sharp contrast to the industry's exuberant reaction to swollen cash flows at the corresponding peak of the previous business expansion in 1974. That year, chemical capital spending shot up 60%, followed by a 15% gain in 1975. However, companies remember, the result was a period of retribution as the chemical industry suffered the flat earnings brought by its overbuilt capacity.

The selectivity in chemical investment this time shows up in C&EN's annual survey of spending plans of the 17 largest U.S. basic chemical companies. Their combined actual spending in 1979 is coming out to about $6.5 billion, up 19% from $5.5 billion in 1978. For 1980, plans call for a combined 13% increase to $7.3 billion.

Inflation is an important corrective to all these figures. Its buildup this year undoubtedly accounts for much of the near doubling in the spending gain for 1979 from the early estimate of 11% over 1978 (C&EN, Dec. 11, 1978, page 10). And inflation will eat away practically all of the chemical industry's anticipated increase in project budgets for 1980.

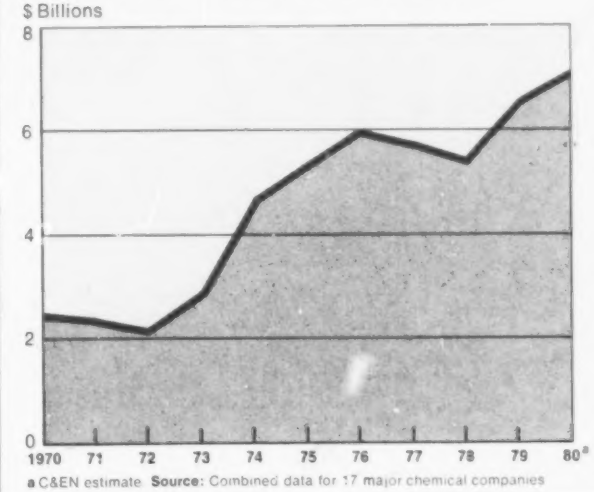
Even without an inflation factor, capital spending in 1979 remains about the same as in 1978 as a percentage of industry sales. Hovering at about 10%, this level is etching out a typical trough in the industry's capital spending cycle. The previous nadir occurred in 1972, also between 9 and 10%.

In 1980, the planned spending rise could beat the increase in sales if a recession strikes the industry. But the margin won't be much, and spending could be pared in a stiff economic downturn.

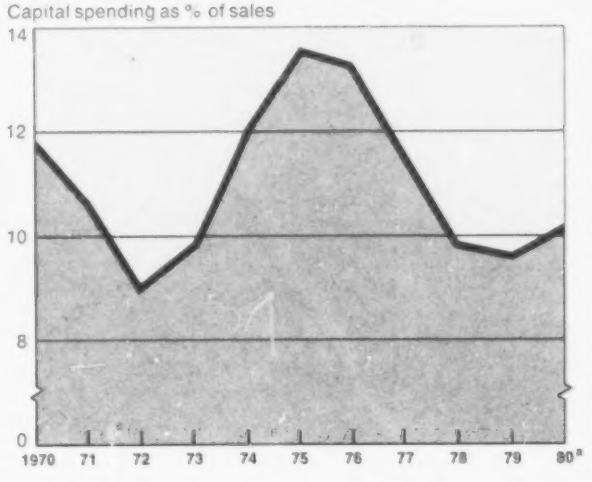
The spending picture in 1980 will not get much help from non-U.S. projects. Although foreign economies are expected to stay healthier than the U.S's., chemical investment now is tilted strongly toward the U.S. This is true for both U.S. and non-U.S. chemical companies' worldwide investments (C&EN, Oct. 15, page 7). An initial Commerce Department survey shows a decline in U.S. chemical foreign affiliates' spending in 1980. In C&EN's survey, most companies' non-U.S. spending segment is staying the same or falling as a percentage of the total in 1980.

The reason for the investment trend toward the U.S. is the same as the boom in U.S. exports. Chemical manufacturing costs in the U.S. enjoy a distinct advantage over costs in other countries. In addition, the chemical industry in the U.S. is not as overbuilt as in Western Europe and Japan, and political and labor relations are more attractive to businessmen.

Chemical capital spending will move up in 1980 for second straight year . . .



. . . but will remain relatively low as a percentage of chemical sales



a C&EN estimate. **Source:** Combined data for 17 major chemical companies

Most chemical companies plan more spending gains in 1980, but a few hold the line

$ Millions	1980 Worldwide	1980 U.S.	1979 Worldwide	1979 U.S.	1979 Planned[a]	Worldwide 1978	1977	1976	1975	Change from previous year 1980	1979
Air Products	$310	$235	$246	$199	$230	$200	$143	$162	$151	26%	23%
Akzona	60	60	57	57	60	42	35	38	51	5	36
Allied Chemical	400	na	400	na	475	502	465	352	314	0	−20
American Cyanamid	na	na	225[b]	185[b]	200	251	235	232	204	na	−10
Celanese	260	224	245	211	245	248	243	223	208	6	−1
Diamond Shamrock	315[b]	285[b]	295[b]	250[b]	215	287	365	310	170	15	−4
Dow Chemical	1200	780	1200	720	1100	1075	1163	1186	922	0	12
Du Pont	1000	880	900	790	1000	714	704	876	1036	11	26
Ethyl Corp.	115	96	105	79	100	96	89	88	69	10	9
W. R. Grace	500	418	450	400	361	275	270	226	306	11	64
Hercules	220	176	175	147	133	116	127	150	151	26	51
Monsanto	680	544	525	420	575	480	607	647	528	30	9
Olin	na	na	160	150[b]	175	163	208	166	99	na	−2
Pennwalt	65	55	68	50	68	62	46	40	32	−4	10
Rohm & Haas	85	65	65	45	80	66	78	110	106	31	−2
Stauffer Chemical	na	na	210	200[b]	188	201	193	199	199	na	4
Union Carbide	1000	700	850	595	725	688	805	965	862	18	17
TOTAL FOR 13 FIRMS[c]	**$5810**	**$4508**	**$5161**	**$3963**	**$4892**	**$4349**	**$4678**	**$5021**	**$4592**		
ANNUAL CHANGE	**13%**	**14%**	**19%**	**18%**	**12%**	**−7%**	**−7%**	**9%**	**13%**		

a Earliest estimate. b C&EN estimate. c Includes only those companies with figures for all seven years. na = not available.

All the more interesting, then, is that capital spending within the U.S. is so cautious. Certainly, the money is available. Figures from the Conference Board, a New York City business research group, show the extent of the chemical industry's financial potential. Quarterly surveys show that the industry's new capital appropriations (money earmarked for projects but not yet spent) hit a record $3.25 billion in the third quarter of 1979. This figure is up 44% from third-quarter 1978. Even corrected for inflation, the rise is 32% to $1.91 billion in constant 1972 dollars. This figure breaks the old constant-dollar record of $1.81 billion set in second-quarter 1974.

Not much of this reserve may have to be spent in any case to achieve a substantial increase in new plant capacity. Dow Chemical comments that one of the major trends of the 1970's in spending breakdowns for various purposes may reverse from now on. Dow considers its extensive campaign to refit existing plants for higher cost efficiency and environmental standards largely completed. These two drives took a great deal of the company's capital spending in recent years—for example, 25% for increased cost efficiency and 15% for safety, health, and pollution control in 1978.

In fact, only 39% of Dow's 1978 capital spending went for plant capacity leading to new sales. This percentage will rise from now on, the company says.

West German spending in U.S. will rise little in 1980

Capital spending in the U.S. by the three largest West German chemical companies will increase very little in 1980 after big jumps in 1979.

Projected spending by the three top West German subsidiaries in the U.S.—American Hoechst, BASF Wyandotte, and Mobay—probably will be up no more than about 4.5% in 1980 over 1979. This trails considerably the average increase projected by U.S. chemical companies of about 10%.

The increase also is less than the 36% increase of the three subsidiaries in 1979 over 1978, or the 20% increase in 1979 by leading U.S. chemical firms.

Individually, U.S. capital spending at American Hoechst will be about $165 million, up about 3% from 1979 spending. Hoechst has budgeted about $171 million for all of North America. Mobay probably will spend about $153 million in 1980, an increase of just 2% over 1979 spending. Spending of BASF Wyandotte will be up 11% to $100 million, the largest gain among the West German-owned companies. BASF Wyandotte had kept spending constant in recent years.

The combined increase in spending is much lower than it has been in the past few years. Between 1976 and 1979, capital spending for the three subsidiaries increased at an average annual rate of 29%. This was led by American Hoechst with an average annual gain of 62%. Most of this spending was for Hoechst's big styrene and high-density polyethylene complex at Bayport, Tex. This investment is ending this year. Mobay has been right on the average from 1976 through 1979 with a 29% average annual growth rate for those years. BASF, however, has slowed the combined rates, growing at an annual rate of 6.3%.

The relatively low increase by the West German-owned firms probably means that there will be a reduction in their U.S. actual construction volume next year, as inflation wipes out some of the gain in the dollars that they have allocated.

U.S. subsidiary (parent)	Capital spending in U.S. ($ millions) 1980[a]	1979	1978	1977	1976	Change 1979–80	Average annual change 1976–79
American Hoechst (Hoechst)	$165	$160	$100	$65	$38	3%	62%
BASF Wyandotte (BASF)	100	90	75	75	75	11	6
Mobay and other subsidiaries (Bayer)	153	150	119	72	70	2	29

a C&EN estimates.

But Dow, like the rest of the chemical industry, is still quite moderate in letting out new project funds. The industry's fixed asset structure is entering the 1980's in trim shape, which companies hope will lead to a faster pickup in profits than in the mid-1970's. □

Hydrogen peroxide gets spate of new capacity

Although U.S. chemical companies have been selective in their investments generally, they have been notably liberal toward hydrogen peroxide, a powerful oxidizing agent with major new markets and possibly more to come. The only question now is: Can the business digest the flood of new plant capacity from major facilities of Interox and FMC?

Last week, Interox America dedicated its new hydrogen peroxide plant at Deer Park, Tex., outside Houston, to become the third major U.S. producer along with FMC and Du Pont. Interox's 88 million lb-per-year plant has been running since late November.

In addition, Interox, a joint venture of Laporte Industries of the U.K. and Solvay & Cie. of Belgium, will make sodium percarbonate at the plant site in a 35 million lb-a-year unit. Hydrogen peroxide to make this sodium percarbonate, a derivative of soda ash, will take about 10% of the capacity of the hydrogen peroxide plant. This leaves just under 80 million lb a year, a lot, for the merchant market.

Until the Interox plant came on stream, U.S. production of hydrogen peroxide had been less than demand of about 240 million lb, 10 to 15% in 1979, or about 30 million lb. Some of the imported material has been supplied by Interox Group plants making various peroxygen compounds. The group operates 49 plants at 22 sites worldwide, with a combined capacity of 1.5 billion lb a year of peroxygens. This capacity includes more than 530 million lb of 100% hydrogen peroxide per year.

Before Interox's Deer Park plant came on stream, U.S. nameplate capacity for hydrogen peroxide had totaled about 270 million lb a year. Du Pont and FMC accounted for about three fourths of the total.

In early 1980, another big hydrogen peroxide plant will be coming on stream. FMC is scheduled to complete a plant in the Bayport, Tex., industrial area with a design capacity of 60 million lb a year of 100% product. Hence, FMC will have the largest hydrogen peroxide capacity.

One smaller capacity change will cut the industrywide total a bit. At the end of 1979, Shell Chemical expects to halt its production, taking away about 35 million lb of available capacity. A large share of Shell's product went to captive uses such as making synthetic glycerine. As a result, the loss to the merchant market for hydrogen peroxide will be small.

On balance, about 115 million lb per year of additional capacity for hydrogen peroxide will be available in the U.S. during most of 1980. The total available capacity then will be close to 385 million lb and capacity use about 65%.

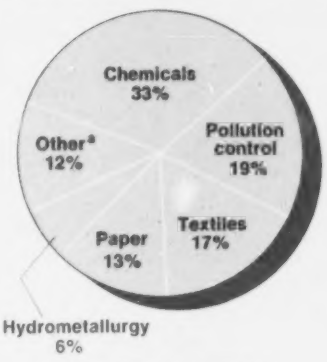
Although this total looks large, it is not quite so formidable as it looks. In the past, peroxide plants have operated at considerably less than nameplate capacity.

In 1979, for example, U.S. consumption is estimated to be 240 million lb of hydrogen peroxide. If imports account for 30 million lb, then U.S. production (excluding production at the new Interox plant) will supply about 210 million lb. Operating rates for U.S. producers would average about 78% of nameplate capacity.

In 1980, U.S. use of peroxide could grow more than the (10-year) average of 5% annually. Even in a recession, growth could exceed 5%, since peroxide's big growth markets may not feel the recession very much.

Over the next five years, compounded annual growth could average 9% annually, says David G. Birney, Interox's vice president for

Industrial uses dominate hydrogen peroxide market



Total 1979 U.S. use[b] = 240 million lb

a Includes personal care products, food processing, and furniture. b As 100% hydrogen peroxide.
Source: Interox America

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